CLAIMS

1. A method for reducing a sulfur-containing compound by hydrogenation, the method comprising the steps of:

hydrogenating the sulfur-containing compound using a noble metal catalyst at a reaction temperature of 150°C to 300°C;

recovering the used noble metal catalyst; and

reusing the noble metal catalyst.

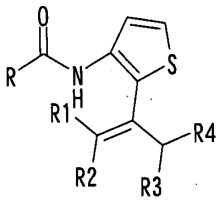
2. The method according to claim 1, wherein the noble metal catalyst comprises palladium.

3. The method according to claim 1, wherein an alcohol of 1 to 8 carbon atoms is used as a reaction solvent in the step of hydrogenating the sulfur-containing compound.

4. The method according to any one of claims 1 to 3, wherein the sulfur-containing compound is a thiophene compound.

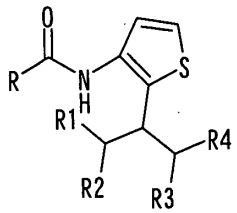
5. The method according to claim 4, wherein the thiophene compound is a thiophene amide.

6. The method according to claim 5, wherein the thiophene amide is represented by general formula (1):



(1)

(wherein R represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aromatic hydrocarbon ring, a substituted or unsubstituted nonaromatic hydrocarbon ring, a substituted or unsubstituted aromatic heterocycle, or a substituted or unsubstituted nonaromatic heterocycle; R1, R2, R3, and R4 independently represent a hydrogen atom, or a linear or branched alkyl group of 1 to 12 carbon atoms; and R1 and R2, R3 and R4, R1 and R3, R1 and R4, R2 and R3, or R2 and R4 may be bonded together to form a cycloalkyl group), and an alkenyl group of the compound represented by general formula (1) is reduced by hydrogenation to produce a 2-alkyl-3-aminothiophene derivative represented by general formula (2):

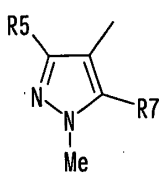


(2)

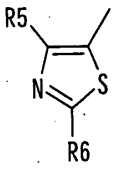
(wherein R, R1, R2, R3, and R4 are as defined above).

7. The method according to claim 6, wherein R in the compounds represented by general formula (1) and general formula (2) is a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted phenyl group.

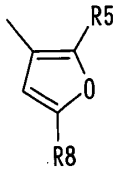
8. The method according to claim 6, wherein R in the compounds represented by general formula (1) and general formula (2) is a group represented by general formulae (A1) to (A12):



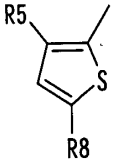
(A1)



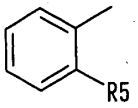
(A2)



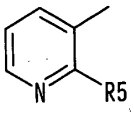
(A3)



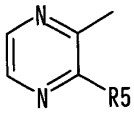
(A4)



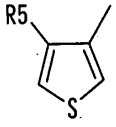
(A5)



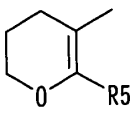
(A6)



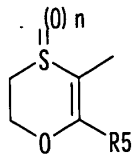
(A7)



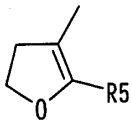
(A8)



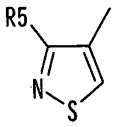
(A9)



(A10)



(A11)



(A12)

(wherein R5 represents a trifluoromethyl group, a

difluoromethyl group, a methyl group, an ethyl group, a hydrogen atom, or a halogen atom; R6 represents a hydrogen atom, a methyl group, a trifluoromethyl group, a halogen atom, a methoxy group, or an amino group; R7 represents a hydrogen atom, a halogen atom, a methyl group, or a methoxy group; R8 represents a hydrogen atom, a methyl group, an ethyl group, or a halogen atom; and n represents an integer of 0 to 2; however, in general formulae (A9), (A10), and (A11), R5 does not represent a halogen atom).

9. The method according to claim 8, wherein R in the compounds represented by general formula (1) and general formula (2) is represented by general formula (A1) in which R5 is a trifluoromethyl group and R7 is a hydrogen atom.

10. The method according to claim 6, wherein each of R1, R2, and R3 in the compound represented by general formula (2) is a hydrogen atom and R4 in the compound represented by general formula (2) is an isopropyl group.